

"On the geological map, inclose by dotted lines, with proper marginal references, those sections of the country in which epidemics have prevailed."

Added to the present volume of *Transactions* is a very full index to the subjects embraced in the several reports from the county medical societies, presented during the five years from 1850 to 1854, inclusive. Such an index greatly enhances the usefulness of those reports, by facilitating a reference to the materials they embody by any one engaged in the investigation of subjects to the elucidation of which they may be made available. It would be desirable to have the transactions of all our State medical societies furnished with a similar index.

D. F. C.

ART. XIV.—*The Cause and Prevention of Yellow Fever, contained in the Report of the Sanitary Commission of New Orleans.* By E. H. BARTON, A. M., M. D., Chairman of the Sanitary Commission; President of the Louisiana State Medical Society, and of the New Orleans Academy of Sciences, etc. Philadelphia: Lindsay & Blakiston, 1855. 8vo. pp. 282.

We have had lying upon our table, for some months past, the *Report of the Sanitary Commission of New Orleans*, and were in hopes to have been enabled to present before now a notice of the very interesting matters embraced in it.

The present work is a reprint of that report, with prefatory remarks, and, as a supplement, a paper read before the Academy of Sciences of New Orleans; the object of these additions being to "fortify the positions taken in the report itself, to extend its illustrations, and to give further explanations of portions of it which have not been so fully understood as they might have been."

The entire volume is one replete with matter of deep and absorbing interest. The views advanced in it, in relation to the cause and prevention of one of the most destructive and appalling epidemics of certain of the cities of our Union, are deserving of a careful and candid examination. They are far from being visionary and hypothetical, but, on the contrary, are apparently the legitimate deductions from well-attested facts and a series of reliable observations.

That the yellow fever requires for its production the concurrence of particular local morbid causes with certain meteorological conditions, is now, we believe, pretty generally conceded. Though it is still a matter of dispute as to the exact character of the former, and of some, at least, of the latter. In the attempt to settle this controversy, and determine what is the nature of the terrene and atmospheric agencies to which yellow fever owes its origin, Dr. Barton has come forward with the aid of his personal observations and investigations. And certainly no one has had more ample opportunities for investigating the etiology of "the dread pestilence," or has more industriously, and, as we believe, more successfully, cultivated those opportunities. Although he may not always present his facts and arguments and deductions in a style exactly suited to a strictly scientific discussion—although certain of the forms of expression he adopts may be esteemed loose, and liable to be misunderstood—we are content to receive the truths he utters, without stopping to criticise a few defects we may observe in the dress in which those truths are set forth.

It will not be in our power to enter upon a formal analysis of the doctrines advanced in the volume before us, in relation to the cause and prevention of yellow fever, nor a comparison of these with the facts and illustrations adduced in their support. We would merely remark that the leading facts would appear to be sufficiently verified, and the illustrations legitimate and apposite.

The following are the general conclusions of the author, as set forth in the ninth section of the report. From these our readers will be able to form a correct idea of the views of Dr. Barton in respect to the etiology of yellow fever, and the principal data upon which those views are based.

"The duty," he remarks, "of tracing the outbreak of the fever—its origin and its transmissibility—has, in the division of duties, devolved upon my col-

league, Dr. Axson, and most ably and graphically has performed the task; clearly demonstrating that it was not from foreign importation that it was derived, but, although connected with foul ships from European ports, that it was due to domestic birth and growth, whether at the levee or elsewhere; and that, at its divers origins, there was no necessary connection the one with another. Now it becomes my duty, under the resolution, in exposing the sanitary condition of the city, to show what and where those causes were. They have before been referred to in general, wherever it has been attempted to demonstrate their applicability, the influence of such causes in similar and in different climates, their direct bearing upon former epidemics, and their influence in the rural districts; and I now proceed to show their special influence in the production of the late epidemic.

"The causes assigned were twofold, and these formed the constituents of the epidemic—1. *Meteorological*; and 2. *Terrene*.

"To the first belonged—A. A long-continued range of tropical temperature preceding the outbreak. The average at midday, of the two preceding months of May and June (instead of being a month later), being nearly 83°, and which continued throughout the epidemic. B. An unusually high hygrometer, which continued and increased, exhibiting an almost saturated atmosphere. C. Heavy rains. D. Unusually high and distressing radiation. And E. An unprecedented intensity and continuance of stagnant air. The unusually early establishment of this *tropicoid* condition, in the elevation of winter temperature to that of spring, and of spring to that of summer, thus anticipating by more than a month the usual evils of autumn, with an aggravation of the burdens ordinarily incident to it, with the extraordinary combination of those which preceded them, were the main *atmospheric elements* which composed it. These are stated in detail in the tables, and for the three epidemic months four or five times daily.

2. The *terrene condition* was composed—A. Of the upturning and exposure of the original soil, in the cleaning out of the canals Claiborne, Carondelet, Marigney, &c.; the immense exposure in making a new basin on Bayou St. John; digging on St. Paul Street to Bayou St. John; digging ditches and clearing between Conti and Common Streets; making a new levee and ditch on Lake Pontchartrain; the digging and embankments on the Northern and Jackson Street Railroads, and extending up within half a mile of Carrollton—approaching the river, and extending near twenty miles in the rear of the plantations; in the centre of the city, the exposure of the subsoil for water-pipes in Bourbon Street, near the water-works—where *some of the first cases occurred*—New Levee, and Post St., and other parts, to the extent of about a mile; and for gas probably as much, and principally in Apollo, and to Nuyades and Dryades, in Galvez and Perdido Streets; and repairing Annunciation, Royal, and Chartres Streets.

"B. Extensive digging and embankments of earth at Algiers, opposite the city—being almost eighteen inches high and eighteen feet wide, ascending the coast for about twenty miles, running from half a mile to a mile from the river, in the immediate rear of the plantations.

"C. The exposure of the naked bank of the river for about six miles, many parts made a common receptacle of, and reeking with garbage and filth of all kinds, exposed to the sun and rain, without a single police officer to prevent its being made a common deposit for these nuisances, or covering or throwing them into the river; besides, the fermenting drainago of sugar and molasses hogsheds on the levee.

"D. The filthiness of the streets, privies, and backyards, a matter of common observation by the public and complaint in the newspapers; the gutters, often twelve hours after a rain which had washed them clear, bubbling up with a gas through dirty water.

"E. The large number of unfilled empty lots and unpaved streets in various parts of the city, and particularly in the Fourth District, which was much the most severely scourged with the fever, in proportion to its population; these low lots being a receptacle for, and exposing filth of all kinds, and stagnant putrid water.

"f. The large open drains in and near the city, including the large ones in rear of the First and Second Districts, and Gormley's Basin, half filled with the refuse of its district.

"g. The nuisances of soap and tallow chandleries, and the large collection of manure near the vacheries of the Fourth District.

"h. The interments, *within the city*, of six cemeteries, the receptacle of 7,063 bodies during the past year, to lend their important aid in corrupting the air.

"i. The numerous slaughter-houses in the Fourth District, and the many large vacheries and livery stables, with their offensive and polluting exhalations.

"k. The crowded, filthy, and unventilated dwellings, in low, damp situations, many in half-drained and unpaved lots and courts, with filthy, stagnant water under the floors.

"l. And about sixty thousand of unacclimated population, which has been added to the city since the last severe epidemic of 1847, and we have aggregated together materials to produce an epidemic, and the food to support it, unprecedented in this country."

Dr. Barton having unfortunately made use of the term "original soil," he has rendered himself the subject of severe criticism, and some unwarranted ridicule, in relation to his views as to one, and a most important, source of morbid terrene exhalations. In the address appended to the report in the present volume, he has explained the sense in which he employed the term—a sense which, it seems to us, must have been very apparent to every one who has carefully read the report with a disposition to arrive at the true meaning of its author.

"The soil," says Dr. B., "as deposited by the river, on its banks, is known to contain very little organic matter; and the simple disturbance of that soil alone, it is not believed, or ever stated, would produce the influence ascribed to the 'terrene.' What is specially denominated and comprehended under this term was distinctly stated to be the rich alluvion of the country, the marsh mud, the detritus and remains of vegetable and animal life, and to be equivalent to putrescible substances of all kinds—the filth of kitchens, stables, vacheries, privies, and every species of filth and offal, the relics of civilized life from whence proceeds the bad air produced by this disturbance and decomposition. These are found mostly in our backyards, in the gutters, streets, open lots, and are especially conspicuous where our pavements are disturbed—for the pebble-stone pavement is eminently objectionable in being the best filterer and retainer of putrescent organic matter. The 'disturbance' of these is always very offensive in hot, humid weather (the meteorological condition), and injurious to health. So the detritus and filth of our canals and basins, when dug out or cleansed, are composed mainly of the same materials; also the deep cuttings and excavations for our railroads, the first cultivation of the soil for agricultural purposes: all are followed by sickness when the meteorological condition is present and of sufficient duration. These results are believed to be uniform, the proofs are positive, the facts are not denied."

Dr. Barton insists that undue dampness of the air is essential to the generation of yellow fever. It is incapable alone, however, of producing the disease, requiring the joint agency of a high and long-continued atmospheric temperature, and local sources of malarial exhalations—among which latter he ranks, as a most efficient one, extensive disturbances of soil replete with organic remains. When these three causes—continued and intense heat, and dampness of the atmosphere, and malaria—are conjoined, he considers that the occurrence of yellow fever is almost inevitable.

We copy from the prefatory remarks the following positions, as expressive of Dr. B.'s views in reference to the agency of dampness in the production of yellow fever:—

"1. The epidemic yellow fever has never occurred here (New Orleans) at its commencement, but during a high dew-point—the minimum being upwards of 74°. In Savannah, last year, it was almost 2° less, and continued for some time.

"2. Yellow fever has always ceased, as an epidemic, before the dew-point descended as low as 58°. In Savannah, last year, it terminated when the dew-point was a fraction less than 65°. In 1848, here, it ceased at a dew-point about

1° higher, although the average of a series of years was when the dew-point reached 62° 12'.

"3. At temperatures of the dew-point below these, sporadic or endemic yellow fever may occur; but it is not known to have existed here, with any certainty, as an epidemic, when the dew-point differed from that above stated.

"4. What is misalled the *contagion of yellow fever*, or its liability to spread, exists only with the first condition.

"This at once strikes at the root of all contagion in yellow fever, *per se*. No one pretends that either *sporadic* or *endemic* yellow fever is contagious. Do these differ from *epidemic* yellow fever in their nature? No one has the hardihood to make any such pretension. A change of air, which suddenly lowers the dew-point to near 58°, here, if continued, puts an end to epidemic yellow fever; a crowded population may enter the city, occupy the houses, rooms, nay, the very beds, which lately reeked with yellow fever, yet not an instance which can be attributed to contagion occurs. The filth, the miasm, and all the 'terrene' matters, are just as before. *But one change has occurred*—the connecting link, the combination, has been broken—the *meteorological element is wanting*, and the *effects* are no longer present. Can anything be more conclusive? Where is the contagion now? Do a few degrees of temperature less at once disarm the giant that has been mowing down, but a day or two before, his countless victims, with his remorseless scythe? The 'contingency' exists no longer. Such a misnemer is applied to no other disease. 'Sober second thoughts,' and sound judgment, worthy to enlighten and guide this people, will not apply it here, when its unsoundness is thus exposed.

"5. The main controlling influence, in all unhealthy situations, is *moisture*, whether in cities, towns, countries, ships, or dwellings, although filth and heat are to be deemed correlative.

"6. *Malaria* is not any *one specific thing*, but all impurities of the air, and organic matter in decomposition, are liable to influence injuriously the organism; and particularly the worn-out excreta of human beings may be so denominated, and is particularly incompatible with healthy action, and, when in combination with the meteorological condition, may produce yellow fever."

It is not our intention to discuss the question as to how far a correlation exists between yellow fever and bilious remittent fever. That, to a certain extent, these two diseases are related, there are many reasons for supposing. They are both, under the influence of particular atmospherical conditions, the endemics of certain localities, where the two may prevail, at the same season, simultaneously; or, as it often happens, the outbreak of yellow fever may be preceded by an unusual prevalence of bilious fever, of an aggravated grade. Still, the two diseases are so clearly distinguishable from each other by broad and unmistakable points of dissimilarity, that their specific difference can scarcely, we think, be disputed. To refer them both, as Dr. B. has done, to the same causes, differing only in their intensity, would be equivalent to an admission that the bilious remittent and yellow fevers are simply different grades of one and the same disease; which can, we think, be very clearly shown not to be the case.

The views of Dr. Barton, in relation to this question, will be seen by the following propositions laid down by him in the supplement to his report in the volume before us. These propositions he believes to be clearly demonstrated by the facts adduced in the report, by experimental observation, and by every principle of fair analogy.

"1. That yellow and bilious fevers proceed from the same causes, although differing in degree and amount.

"2. That these causes, acting upon individuals of different susceptibilities—as the acclimated, or native, and the unacclimated—produce these different effects: in the first, developing a milder grade of periodic fever; and in the second, the aggravated form, or yellow fever.

"3. That the main pathological cause of the difference in the phenomena exhibited in yellow fever from bilious fever arises from the difference in the rank and importance of the organs attacked in each case respectively: in the first, it is on organs whose integrity is more immediately essential to life, as the

nervous and sanguiferous systems, or those of cerebral life; and in the second, developing its influence on subsidiary organs, or those of rather secondary importance, those of animal life, as the liver, spleen, stomach, etc.

"4. That these causes proceed from all the circumstances that impair the purity of the air, which is essential to healthy existence, proceeding from vegetable and animal decomposition of all kinds, and disturbances of the original soil; that these, in the aggregate, constitute *malaria*, together with certain meteorological conditions, which are indispensable to give it activity.

"5. That all that we know of *contagion* is, that, being a specific virus, the product of secretory action, *it must be*, in its very nature, independent of all these circumstances and conditions; the existence and the spread of these can necessarily have no connection with it. But, as all the conditions productive of vitiated or bad air must tend to extend the above influences within the area of that impure air, and in proportion to that impurity and the meteorological condition, so the susceptibility to the spread of these diseases will exist.

"6. The final proof of all these propositions is, that when the conditions above pointed out are removed, or no longer exist, the effects cease, *causa sublata tollitur effectus*."

We have endeavoured, in the above notices of the treatise of Dr. Barton, to present our readers with an accurate outline of the views entertained by its author in regard to the etiology—the cause of yellow fever. For the very able and skilful manner in which those views are "reasoned out," illustrated, and supported, for the large array of facts adduced in their defence, and for the application of those views to the all-important subject, the means for the prevention of yellow fever, we refer our readers to the work itself. It is one well deserving of an attentive study. No one can rise from its perusal without instruction—without having acquired more definite and philosophical views in respect to the source and origin of a pestilence that has already wrought, on more than one occasion, dismay and death among the populations of several of our cities, and which may again, in the absence of a complete, watchful, and judicious system of hygienic police, visit with destruction the same localities, or even others, the indwellers of which may now feel themselves in entire security. For we fully believe, with Dr. Barton, that wherever there shall become conjoined an intense and long-continued atmospherical temperature, undue moisture, and extensive sources of malarial exhalations, the development of fever may be anticipated with tolerable certainty. And the concurrence of these conditions in several of our cities, where the disease has never, or at least not for many years, made its appearance, is neither impossible nor improbable.

D. F. C.

ART. XV.—*Report of the Board of Trustees (including that of the Resident Physician) of the Insane Asylum of the State of California.* Submitted to the Legislature, January 20th, 1854.

CALIFORNIA contains at present a large population assembled with a rapidity which has had no parallel in the settlement of any portion of the globe. They have congregated under the influence of the faculty of acquisitiveness. They have come from every quarter of the world. They speak a great diversity of languages. They are mostly men, and in the prime of energetic manhood. They present every grade of intellectual and moral cultivation; but, unfortunately, in the majority these characteristics are of the lower orders. All shades of habit, a wonderful heterogeneity of customs, all modes of social thought, habitudes to all modes of civil government, and all religious faith are represented by them. The adhesive power ordinarily found among great bodies of men, are here in a great measure wanting. There is no general bond of sympathy, but simply that of *manhood*, a bond less firmly tied, and more easily severed, than the Gordian knot.

"California ought to produee," says the report before us, "a race of men the